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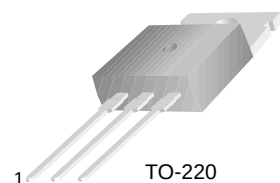


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## Monolithic Construction With Built In Base-Emitter Shunt Resistors

- High DC Current Gain :  $h_{FE}=1000$  @  $V_{CE}=4V$ ,  $I_C=3A$  (Min.)
- Collector-Emitter Sustaining Voltage
- Low Collector-Emitter Saturation Voltage
- Industrial Use
- Complementary to TIP105/106/107

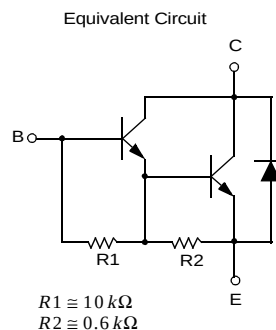


1.Base 2.Collector 3.Emitter

## NPN Epitaxial Silicon Darlington Transistor

### Absolute Maximum Ratings $T_C=25^\circ C$ unless otherwise noted

| Symbol    | Parameter                                  | Value      | Units      |
|-----------|--------------------------------------------|------------|------------|
| $V_{CBO}$ | Collector-Base Voltage : TIP100            | 60         | V          |
|           | : TIP101                                   | 80         | V          |
|           | : TIP102                                   | 100        | V          |
| $V_{CEO}$ | Collector-Emitter Voltage : TIP100         | 60         | V          |
|           | : TIP101                                   | 80         | V          |
|           | : TIP102                                   | 100        | V          |
| $V_{EBO}$ | Emitter-Base Voltage                       | 5          | V          |
| $I_C$     | Collector Current (DC)                     | 8          | A          |
| $I_{CP}$  | Collector Current (Pulse)                  | 15         | A          |
| $I_B$     | Base Current (DC)                          | 1          | A          |
| $P_C$     | Collector Dissipation ( $T_a=25^\circ C$ ) | 2          | W          |
|           | Collector Dissipation ( $T_C=25^\circ C$ ) | 80         | W          |
| $T_J$     | Junction Temperature                       | 150        | $^\circ C$ |
| $T_{STG}$ | Storage Temperature                        | - 65 ~ 150 | $^\circ C$ |



### Electrical Characteristics $T_C=25^\circ C$ unless otherwise noted

| Symbol         | Parameter                            | Test Condition                                                                          | Min.            | Max.           | Units   |
|----------------|--------------------------------------|-----------------------------------------------------------------------------------------|-----------------|----------------|---------|
| $V_{CEO(sus)}$ | Collector-Emitter Sustaining Voltage | $I_C = 30\text{mA}$ , $I_B = 0$                                                         | 60<br>80<br>100 |                | V       |
|                | : TIP100                             |                                                                                         |                 |                | V       |
|                | : TIP101                             |                                                                                         |                 |                | V       |
|                | : TIP102                             |                                                                                         |                 |                | V       |
| $I_{CEO}$      | Collector Cut-off Current            | $V_{CE} = 30V$ , $I_B = 0$<br>$V_{CE} = 40V$ , $I_B = 0$<br>$V_{CE} = 50V$ , $I_B = 0$  |                 | 50<br>50<br>50 | $\mu A$ |
|                | : TIP100                             |                                                                                         |                 |                | $\mu A$ |
|                | : TIP101                             |                                                                                         |                 |                | $\mu A$ |
|                | : TIP102                             |                                                                                         |                 |                | $\mu A$ |
| $I_{CBO}$      | Collector Cut-off Current            | $V_{CE} = 60V$ , $I_E = 0$<br>$V_{CE} = 80V$ , $I_E = 0$<br>$V_{CE} = 100V$ , $I_E = 0$ |                 | 50<br>50<br>50 | $\mu A$ |
|                | : TIP100                             |                                                                                         |                 |                | $\mu A$ |
|                | : TIP101                             |                                                                                         |                 |                | $\mu A$ |
|                | : TIP102                             |                                                                                         |                 |                | $\mu A$ |
| $I_{EBO}$      | Emitter Cut-off Current              | $V_{EB} = 5V$ , $I_C = 0$                                                               |                 | 2              | mA      |
| $h_{FE}$       | DC Current Gain                      | $V_{CE} = 4V$ , $I_C = 3A$                                                              | 1000            | 20000          |         |
|                |                                      | $V_{CE} = 4V$ , $I_C = 8A$                                                              | 200             |                |         |
| $V_{CE(sat)}$  | Collector-Emitter Saturation Voltage | $I_C = 3A$ , $I_B = 6\text{mA}$                                                         |                 | 2              | V       |
|                |                                      | $I_C = 8A$ , $I_B = 80\text{mA}$                                                        |                 | 2.5            | V       |
| $V_{BE(on)}$   | Base-Emitter ON Voltage              | $V_{CE} = 4V$ , $I_C = 8A$                                                              |                 | 2.8            | V       |
| $C_{ob}$       | Output Capacitance                   | $V_{CB} = 10V$ , $I_E = 0$ , $f = 0.1\text{MHz}$                                        |                 | 200            | pF      |

## Typical Characteristics

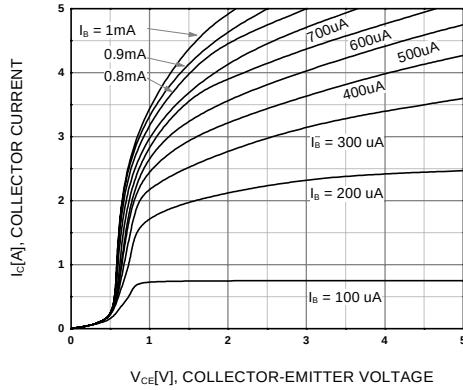


Figure 1. Static Characteristic

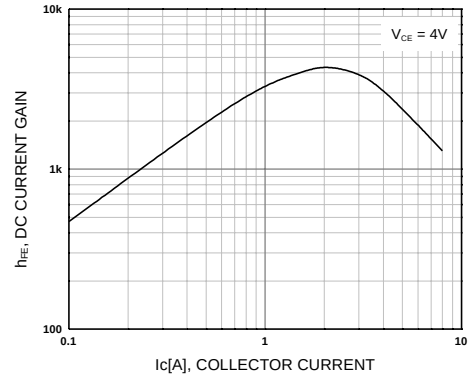


Figure 2. DC current Gain

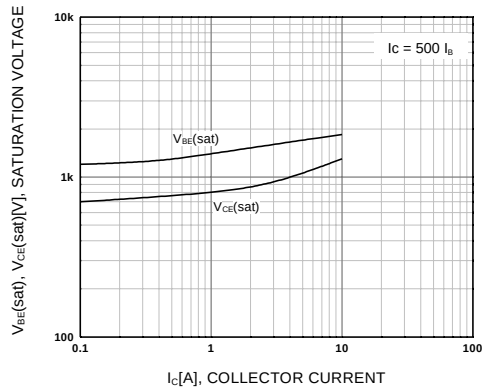


Figure 3. Collector-Emitter Saturation Voltage  
Base-Emitter Saturation Voltage

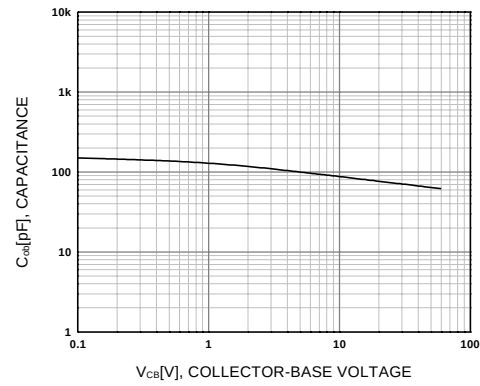


Figure 4. Collector Output Capacitance

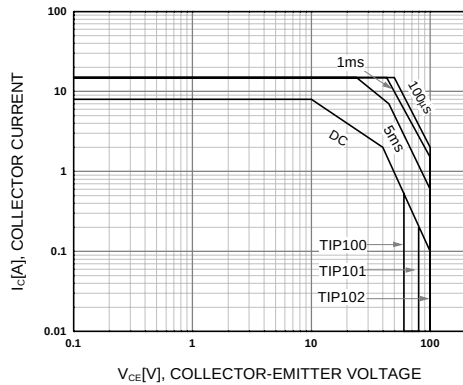


Figure 5. Safe Operating Area

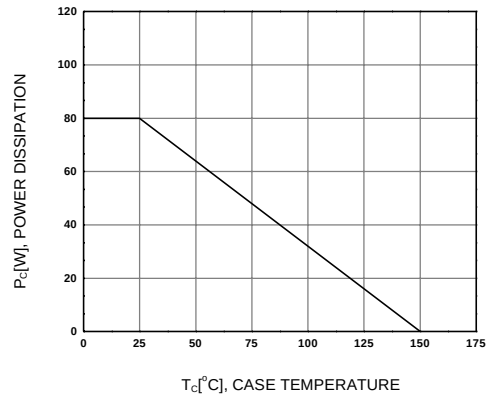
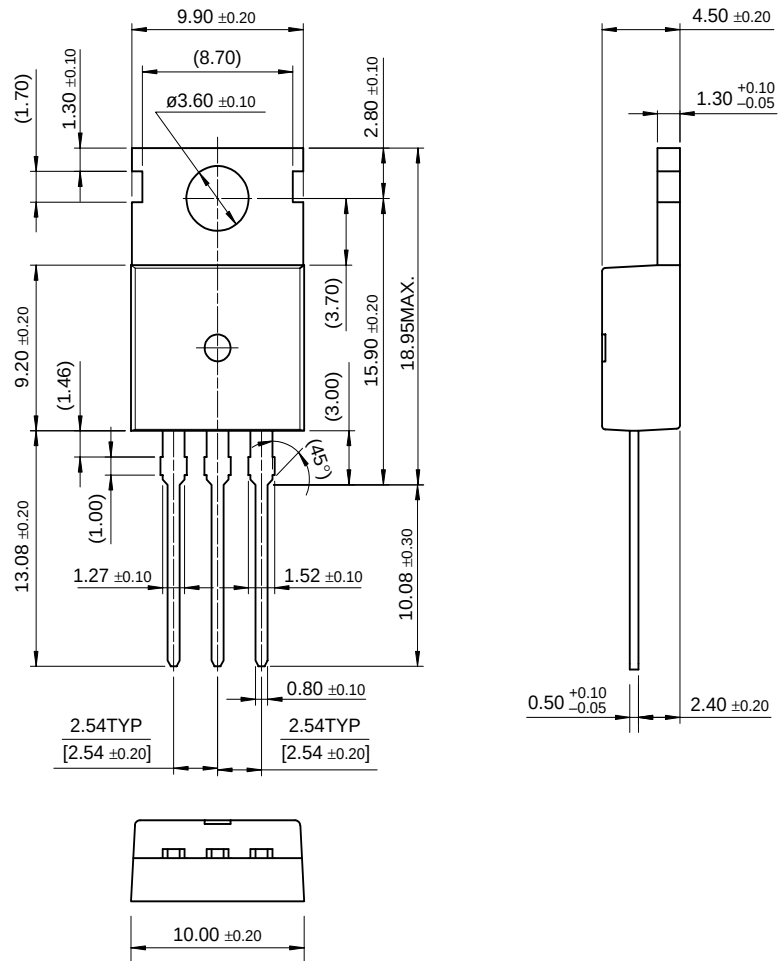


Figure 6. Power Derating

# Package Dimensions

## TO-220



Dimensions in Millimeters

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